

REMARKS/ARGUMENTS

Favorable reconsideration of this application, as presently amended and in light of the following discussion, is respectfully requested.

Claims 9-14 and 19-20 are currently pending, Claims 9, 19, and 20 having been amended, and Claims 1-8 and 15-18 having been canceled without prejudice or disclaimer. The changes and additions to the claims do not add new matter and are supported by the originally filed specification, for example, on Figs. 1, 2, 9, and 10.

In the outstanding Office Action, Claims 19-20 were rejected under 35 U.S.C. §102(b) as being anticipated by Quake (U.S. Pub. No. 2002/0058332); Claims 9-14 were rejected under 35 U.S.C. §103(a) as being unpatentable over Higuchi (U.S. Patent No. 7,268,167) in view of Quake.

With respect to the rejection of Claim 9 under 35 U.S.C. §103(a), Applicants respectfully traverse this ground of rejection in part and submit that the present clarifying amendment overcomes this ground of rejection. Amended Claim 9 recites, *inter alia*,

(a) an intersection portion at which a first continuous phase supplied from a continuous phase supply channel, a first dispersion phase supplied from a first dispersion phase supply channel, and a second dispersion phase supplied from a second dispersion phase supply channel intersect with each other;

(b) a first liquid feed device controlling the first dispersion phase;

(c) a second liquid feed device controlling the second dispersion phase; and

(d) a control device connected to the first liquid feed device and the second liquid feed device,

wherein (e) the first liquid feed device and the second liquid feed device are controlled by a signal from the control device so that microdroplets formed of the first dispersion phase and microdroplets formed of the second dispersion phase are sequentially produced.

In a non-limiting example of the invention defined by Claim 9, Applicants' Fig. 1 shows (a) an intersection portion (7) at which a first continuous phase (2) supplied from a continuous phase supply channel (1), a first dispersion phase (4) supplied from a first dispersion phase supply channel (3), and a second dispersion phase (6) supplied from a second dispersion phase supply channel (5) intersect with each other; (b) a first liquid feed device (12) controlling the first dispersion phase (4); (c) a second liquid feed device (13) controlling the second dispersion phase (6); and (d) a control device (11) connected to the first liquid feed device (12) and the second liquid feed device (13), wherein (e) the first liquid feed device (12) and the second liquid feed device (13) are controlled by a signal from the control device (11) so that microdroplets (9) formed of the first dispersion phase (4) and microdroplets (10) formed of the second dispersion phase are sequentially produced.

Turning to the applied art, Higuchi is directed to a process for rapidly producing an emulsion and microcapsules in a simple manner. Fig. 6 of Higuchi shows that a dispersion phase 28 is fed from a dispersion phase feeding channel 27 and is ejected toward the junction 26 to intersect flows of the first continuous phase 24 and the second continuous phase 25 flowing in the microchannels 22 and 23, respectively, in such a manner that the flow of the dispersion phase 28 fed from the dispersion phase feeding channel 27 to join the flows of the first continuous phase 24 and the second continuous phase 25, thereby producing the microdroplets 29.

However, as acknowledged in the Office Action, Higuchi does not describe all of "(b) a first liquid feed device controlling the first dispersion phase; (c) a second liquid feed device controlling the second dispersion phase; and (d) a control device connected to the first liquid feed device and the second liquid feed device, wherein (e) the first liquid feed device and the second liquid feed device are controlled by a signal from the control device so that

microdroplets formed of the first dispersion phase and microdroplets formed of the second dispersion phase are sequentially produced,” as required by Claim 9.

The Office Action relies on Quake to remedy the deficiencies of Higuchi with regard to Claim 9.

Quake is directed to a microfluid device for analyzing and/or sorting biological materials (see Abstract). The Office Action relies on paragraph [0290] of Quake to remedy the deficiencies of Higuchi with regard to Claim 9. In Quake, the pressures of the fluids at the inlet streams are balanced so that the droplet fluid enters the main channel at a fixed frequency (see para. [0290]). Quake also teaches that because the frequency with which droplets are sheared off into the main channel depends on the pressure difference between the different fluids, the frequency can be readily adjusted by simply adjusting the pressures of the individual fluid lines.

However, adjusting the pressures of different fluids so that their pressures are balanced is not the same as controlling a first liquid feed device and a second liquid feed device by a signal from a control device so that microdroplets formed of the first dispersion phase and microdroplets formed of the second dispersion phase *are sequentially produced*.

Therefore, Applicants submit that Quake fails to disclose or suggest all of “(b) a first liquid feed device controlling the first dispersion phase; (c) a second liquid feed device controlling the second dispersion phase; and (d) a control device connected to the first liquid feed device and the second liquid feed device, wherein (e) the first liquid feed device and the second liquid feed device are controlled by a signal from the control device so that microdroplets formed of the first dispersion phase and microdroplets formed of the second dispersion phase are sequentially produced,” as required by Claim 9.

Therefore, Applicants respectfully submit that Claim 9 (and all associated dependent claims) patentably distinguishes over Higuchi and Quake, either alone or in proper combination.

With respect to the rejection of Claims 19-20 under 35 U.S.C. §102(b), Applicants respectfully traverse this ground of rejection in part and further submit that the present clarifying amendment overcomes this ground of rejection. Amended Claim 19 recites, *inter alia*,

- (a) a microdroplet producing portion producing primary droplets and satellite droplets produced together with the primary droplets;
- (b) a microdroplet supply channel supplying microdroplets from the microdroplet producing portion;
- (c) an expansion portion connected to the microdroplet supply channel; and
- (d) a branching portion having a satellite droplet recovery channel to recover the satellite droplets and a primary droplet recovery channel connected to a front end of the expansion portion to recover the primary droplets.

In a non-limiting example of the invention defined by Claim 19, Applicants' Fig. 9 shows a microdroplet producing portion (53) producing primary droplets (57) and satellite droplets (58) produced together with the primary droplets (57); a microdroplet supply channel (56) supplying microdroplets (57, 58) from the microdroplet producing portion (53); an expansion portion (61) connected to the microdroplet supply channel (56); and a branching portion (62) having a satellite droplet recovery channel (65) to recover the satellite droplets (58) and a primary droplet recovery channel (63) connected to a front end of the expansion portion (61) to recover the primary droplets (57).

Quake, on the other hand, discloses two different droplets, droplets to be collected (○) and droplets to be wasted (●), which are sorted at the junction by a detection window (see Figs. 14 and 15). However, the wasted droplets in Quake are not "satellite droplets" and

Quake clearly never discloses or suggests “a branching portion having a satellite droplet recovery channel to recover the satellite droplets and a primary droplet recovery channel connected to a front end of the expansion portion to recover the primary droplets,” as required by Claim 19.

Therefore, Applicant submits that Quake fails to disclose or suggest all of “(a) a microdroplet producing portion producing primary droplets and satellite droplets produced together with the primary droplets; (b) a microdroplet supply channel supplying microdroplets from the microdroplet producing portion; (c) an expansion portion connected to the microdroplet supply channel; and (d) a branching portion having a satellite droplet recovery channel to recover the satellite droplets and a primary droplet recovery channel connected to a front end of the expansion portion to recover the primary droplets,” as required by Claim 19.

Furthermore, Claim 20 recites, *inter alia*,

- (a) a microdroplet producing portion producing first and second primary droplets and first satellite droplets produced together with the first primary droplets and second satellite droplets produced together with the second primary droplets;
- (b) a microdroplet supply channel supplying the first and second primary microdroplets and the first and second satellite microdroplets from the microdroplet producing portion;
- (c) an expansion portion connected to the microdroplet supply channel; and
- (d) a branching portion having a primary droplet recovery channel connected to a front end of the expansion portion to recover the first and the second primary droplets, a first satellite droplet recovery channel to recover the first satellite droplets, and a second satellite droplet recovery channel to recover the second satellite droplets.

For similar reasons as discussed above for Claim 19, Applicants submit that Quake does not disclose or suggest all of the features of Claim 20.

Applicants emphasize that for anticipation, "[t]he identical invention must be shown in as complete detail as is contained in the ... claim." See *Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 1236, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989). (See also MPEP §2131).

Higuchi has been considered but fails to remedy the deficiencies of Quake with regard to Claims 19-20. Therefore, Applicants respectfully submit that Claims 19-20 patentably distinguish over Quake and Higuchi, either alone or in proper combination.

Furthermore, Applicants note that the Office Action has not addressed at all the specific features of dependent Claims 10-14 (see Office Action, at pages 3-4). Applicants respectfully request that the features of all of the claims be properly considered and submit that a final Office Action cannot be issued without the specific features of all of the claims being properly addressed.

Consequently, in light of the above discussion and in view of the present amendment, the outstanding grounds for rejection are believed to have been overcome. The present application is believed to be in condition for formal allowance. An early and favorable action to that effect is respectfully requested. Furthermore, the examiner is kindly invited to contact the Applicants' undersigned representative at the phone number below to resolve any outstanding issues.

Respectfully submitted,

OBLON, SPIVAK, McCLELLAND,
MAIER & NEUSTADT, L.L.P.



Gregory J. Maier
Attorney of Record
Registration No. 25,599

Customer Number
22850

Tel: (703) 413-3000
Fax: (703) 413 -2220
(OSMMN 07/09)

Sameer Gokhale
Registration No. 62,618